

REMARKS

Applicant requests reconsideration of the refusal of the claims as now presently presented, namely claims 1, 3-9, 11 and 13-23. Claim 1 has been amended to accurately clarify and focus on the novel process as is new claim 23, all fully supported by the specification and drawings.

The Examiner contends that:

“Neither Schulz-Harder nor Ohsawa teaches removing the metal bordering the resist. However, this would have been obvious to one of ordinary skill in the art at the time of the invention because one generally uses resists to cover areas where one does not want an etchant, for example, to remove the surface material. Therefore, it would have been obvious to remove metal bordering the resist. If one did not want that material to be removed, it too would have been covered resist.”

The subject matter of this invention is not the normal structuring process of a metal coating by a masking and edging process for forming the structured metal layer or conductive tracks and contact surfaces, but the essential features of the inventive process are that after structuring the metal coating for forming the conductive tracks at contact surfaces is provided, that means after the mask of a photoresist or edging resist of the masking edging process had been completely removed from the structured metal layer further processing steps are preformed, namely applying the coating of the brazing resist to the structured metal coating and removing some of the metal of the structured metal layers in an amount of 0.1-20 μm in such surface areas of the structured metal layer which border the brazing resist coating.

These further steps have nothing to do with the masking and edging process for structuring the metal layer in order to form conductive tracks or contact surfaces, because the brazing resist is not a suitable material for an edging resist mask. Therefore, the further edging after applying the brazing resist to the structured metal layer is performed only to such an extent, that the removal of metal takes place with a thickness of 0.1 to 20 microns.

This is fully explained at page 6, last paragraph, page 7, first paragraph and page 8, first paragraph of the English translation of the specification.

Although the removal of material in the second edging step (after the brazing resist had been applied) is very small and although a structuring of the metal is actually not obtained by this second edging step, this second edging improves the brazing resist effect, as the surface of the metal layer in the regions bordering the brazing resist layer is lower than the surfaces of the brazing resist and even when applying a metal coating, for example, nickel coating to the surfaces of the structured metal layer bordering the brazing resist, the surface of the metal bordering the brazing resist is not higher than the brazing resist.

In this connection, we refer you to Figures 4 and 5 of this application and to the corresponding description.

The brazing resist coating is applied to the unclean or untreated and therefore somewhat rough oxidized metal surfaces, so that also the bonding of the brazing resist coating to the metal foils or metal coatings is improved by the rough and uncleaned metal surfaces. Furthermore, when removing some metal of the metal coating in areas bordering the brazing resist coating the metal thickness is reduced in these areas, so that barriers are formed in between the areas bordering the brazing resist coating and such areas covered by the brazing resist coating. These barriers assist the brazing resist when electronic components are applied by soldering to the conductive tracks or conductive surfaces outside the brazing resist coating. This means, that areas with reduced metal thickness may be used for receiving soldering material or for receiving the metal of a further metal coating so that the surface of this further metal coating is not above the structure of the brazing resist coating and the brazing resist coating can be full effective during a brazing process (see also figure 4 of this application).

The prior art does not teach a process or method with the features of the new claims 1 or 23.

US 5 981 036

This cited art only teaches a method for producing a metal-ceramic substrate by a high bonding process, namely by the DCB-process. A brazing resist is not referred to at all in this document.


US 5 736 377

This document teaches a method of manufacturing a lead frame and of contacting the inner leads of the lead frame to electrodes of semiconductor chips or to electrodes of a printed circuit board comprising an organic substrate which is not at all suitable for a high temperature bonding process.

Furthermore this document teaches the use of solder resist (6) in between of the electrodes or lead structures.

Reconsideration of the refusal of the claims as presently on file is requested.

Respectfully submitted,


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